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Docket No.

113692.34

Application No.

09/858,188

Filing Date

May 15, 2001

Examiner

Jerry Johnson

Customer No.

041068

Group Art Unit

1764Invention: **Reduced Emissions Transportation Fuels****OCT 20 2004**

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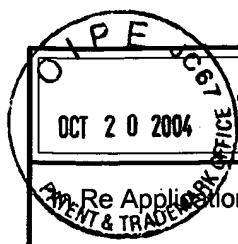
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10-21-04

AF/1764



TRANSMITTAL OF APPEAL BRIEF (Large Entity)

Docket No.
113692.34

Re Application Of: **Helen M. Doherty et al.**

| Application No. | Filing Date | Examiner | Customer No. | Group Art Unit | Confirmation No. |
|-----------------|--------------|---------------|--------------|----------------|------------------|
| 09/858,188 | May 15, 2001 | Jerry Johnson | 041068 | 1764 | 9327 |

Invention: **Reduced Emissions Transportation Fuels**

COMMISSIONER FOR PATENTS:

Transmitted herewith in triplicate is the Appeal Brief in this application, with respect to the Notice of Appeal filed on

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Dated: **October 20, 2004**

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Attorney's Docket No. 113692.34

Patent

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Helen M. Doherty et al :

Group No. : 1764

Serial No.: 09/858,188

Examiner: Jerry Johnson

Filed: May 15, 2001

For: Reduced Emissions Transportation Fuels

BRIEF ON APPEAL UNDER 37 C.F.R. § 1.192

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Real party in interest

Applicant's real party in interest is:

Sunoco, Inc. (R&M)
1801 Market Street
Philadelphia, PA 19103

Related appeals and interferences

Applicants, applicant's assignee and applicant's legal representative are unaware of any appeals or interferences that are related to the instant appeal, or that will affect, be affected by or have any bearing on the Board's decision in the instant appeal.

Status of the Claims

As originally filed, the application contained claims 1-15. Claims 16-19 were added by amendment. Claims 1-11, 13 and 15 are withdrawn from consideration without prejudice or disclaimer. Claims 12 and 14 are cancelled. Claims 16-19 are pending and are being appealed.

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Applicants appeal from the rejection of claims 16-19 under 35 U.S.C. § 103(a) and under 35 U.S.C. § 112, first paragraph.

Status of amendments

No amendments have been filed subsequent to final rejection.

Summary of invention

Claims 16-19 on appeal define an oxygenated transportation fuel complying with the emissions performance requirements of the Clean Air Act Amendments for Conventional Gasoline and for Reformulated Gasoline as predicted by the EPA Complex Model, said transportation fuel comprising a blend of hydrocarbon streams, said blend having: a sulfur content of less than about 300 ppm; an octane rating of from about 87 to about 94; an olefins content of greater than about 15%; a Reid Vapor Pressure of less than 7.5 psi; at least one oxygenate; and specific limits on a 50% D-86 distillation point and a 90% D-86 distillation point.

Support for each of these items in the specification is listed below, where the paragraph in the specification that supports each item is given in brackets following the item.

An oxygenated transportation fuel complying with the emissions performance requirements of the Clean Air Act Amendments for Conventional Gasoline and for Reformulated Gasoline as predicted by the EPA Complex Model [0009], said transportation fuel comprising a blend of hydrocarbon streams, said blend having: a sulfur content of less than about 300 ppm [0011]; an octane rating of from about 87 to about 94 [0011]; an olefins content of greater than about 15% [0011]; a Reid Vapor Pressure of less than 7.5 psi [Tables 1, 2 and 4]; at least one oxygenate [0012]; and specific limits on a 50% D-86 distillation point and a 90% D-86 distillation point [0011].

Issues Presented for Appeal

Whether the Examiner erred in rejecting claims 16-19 under 35 U.S.C. § 103(a) as being unpatentable over Townsend et al.

Whether the Examiner erred in rejecting claims 16-19 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement because the claims contained subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Grouping of Claims

Claims 16 - 19 can be grouped together since claim 16 is the independent claim and claims 17 - 19 limit claim 16.

Group I.

Claims 16 - 19 recite an oxygenated transportation fuel complying with the emissions performance requirements of the Clean Air Act Amendments for Conventional Gasoline and for Reformulated Gasoline as predicted by the EPA Complex Model. The transportation fuel comprising a blend of hydrocarbon streams, with the resulting blend having the following properties: a sulfur content of less than about 300ppm; an octane rating of from about 87 to about 94; a 50% D-86 distillation point of less than about 235°F; a 90% D-86 distillation point of less than about 360°F; an olefins content of greater than about 15%; a Reid Vapor Pressure of less than 7.5; and at least one oxygenate. Preferred oxygenates are ethyl tert-butyl ether, methyl tert-butyl ether, tert-amyl methyl ether, methanol and ethanol. The 50% D-86 distillation point may be limited to being greater than about 215°F. The 90% D-86 distillation point may be limited to being greater than about 315°F. None of the claims of this group are considered to be patently distinct from one another.

Argument

It is respectfully submitted that the Examiner has committed several errors in the rejection of claims 16-19 under 35 U.S.C. § 103(a) as being obvious over Townsend et al. First, the Examiner misread the teachings of Townsend, which teaches the reduction in the concentration of olefins in reformulated gasoline to produce clean-burning reformulated gasoline. Second, the Examiner erred in the application of the teachings of Townsend to the claims on appeal and failed to establish any of the three elements of a *prima facie* case of obviousness. The Examiner has failed to show any motivation to modify the teachings in Townsend, or other relevant prior art, to obtain the claims on appeal. The Examiner has not demonstrated a reasonable expectation of success. The Examiner has not shown that Townsend teaches all the claim limitations of the claims on appeal. Third, the Examiner has failed to recognize that Townsend and other relevant prior art "teaches away" from the claims on appeal. Fourth, the Examiner failed to realize that the claimed ranges of the concentration of olefins in Townsend and the claims on appeal do not overlap, and that the items within each of these groups have distinct properties. Finally, the Examiner has failed to present a convincing line of reasoning as to why the claims on appeal would have been obvious in light of the teachings of Townsend.

It is further respectfully submitted that the Examiner erred in the rejection of Claims 16-19 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement by "failing to teach an oxygenated fuel having an octane rating of about 87 to about 94". Several tables in the specification provided numerous examples of oxygenated fuels have octane ratings of 87, 93 and 94.

I. Rejection under 35 U.S.C. § 103(a) is Improper

It is respectfully submitted that the Examiner has committed errors in the rejection of Claims 16-19 as being unpatentable under 35 U.S.C. § 103(a) as being obvious over Townsend et al. (SIR H1305).

To establish a *prima facie* case of obviousness, three basic criteria must be met:

- 1) There must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings.
- 2) There must be some reasonable expectation of success.
- 3) The prior art reference (or references when combined) must teach or suggest all the claim limitations.

The teaching or suggestion to make the claimed combination and reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 94777 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

In order to evaluate these criteria, it is necessary to determine what Townsend teaches. Townsend's teachings can be grouped into two related areas: (1) a method of reformulating gasoline, which comprises several steps including reducing the concentration of olefinic compounds, to produce clean-burning reformulated gasoline; and (2) the reformulated gasoline, which has a concentration of olefins in the range of about 4 to 10 volume percent.

It is respectfully submitted that the Examiner has committed errors as a result of misreading the teachings of Townsend, and in applying the teachings of Townsend to the current case. As a threshold matter, Townsend et al. does not teach or suggest an olefin content of greater than about 15 percent, as recited in claim 16 of the current application. Applicants respectfully submit that Townsend teaches reduced concentrations of olefins in

reformulated gasoline, but not increased concentrations. There is no implicit or explicit teaching or mention in Townsend of having increased concentrations of olefins, only reduced concentrations of olefins are described. All mentions of reduced concentrations of olefins are cited below:

Abstract : "(b) reducing said concentration of olefinic compounds;"

Column 3, line 22 : "(b) reducing the concentration of olefinic compounds in the gasoline."

Column 3, line 37 : "It is also preferred that the concentration of olefinic compounds is reduced in the reformulated gasoline in an amount ranging from about 10 to about 70 percent of the olefins in unreformulated gasolines, and in another variation, olefinic compounds' concentration is more preferably reduced in the range of about 40 to 60 percent."

Column 6, line 9 : "Reduction of the concentration of olefinic compounds to produce a reformulated gasoline comprising a reduced olefin concentration relative to a base, unreformulated gasoline is preferably accomplished by one or more known refining procedures."

Column 6, line 44 : "(b) a concentration of olefins in the range of about 4 to about 10 volume percent;"

Column 12, line 60: Claim 1. "reducing said concentration of olefinic compounds;"

Column 13, line 1 : Claim "3. A method in accordance with claim 1 wherein said concentration of olefinic compounds is reduced in an amount ranging from about 10 to about 70 percent."

Column 13, line 45 : Claim 13 "b. a concentration of olefins in the range of about 4 to about 10 volume percent;"

Table 1: provides the four examples of fuel described in their invention, with the concentration of olefins ranging from 5.0 - 5.5 percent, while the industry average base fuel is 9.7 percent.

For the industry average base fuel, with an average olefin concentration of 9.7 percent, a 10 to 70 reduction in the olefin concentration would result in olefin concentrations of 8.7 and 2.8 percent, respectively. These reduced concentrations of olefins are much lower than the level of "greater than about 15 percent" recited in claim 16 of the claims on appeal.

The first criteria needed to establish obviousness is that there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings.

Examiner has admitted that Townsend does not disclose all of the features recited in claim 16:

"While Townsend et al. differ from the instant claims in not disclosing an example of a fuel composition having all of the instantly claimed properties , ..." (Final Office Action - page 3, lines 16-17)

Applicants respectfully submit that Townsend and the claims on appeal define two separate inventions, and it is not simply a matter that Townsend does not disclose an example of a fuel composition having all of the instantly claimed properties. There is no motivation in Townsend to modify its teachings to produce a fuel with an olefins content greater than 15 percent. No motivation to do so in the art generally has been presented by Examiner. As will be shown below, the art at the time the claims on appeal were filed taught that reduction in olefin concentration is needed to produce low emission fuels. Even if motivation could be found in the art in general, that teaching would conflict with the teaching of Townsend that lower olefins contents are not only preferable, but are to be "in the range of about 4 to about 10 volume percent".

Townsend's teachings that reduced olefin concentrations are needed to reduce vehicle exhaust emissions of hydrocarbons and NO_x are also taught in U.S. 5,288,393 ('393 Patent) and U.S. 5,653,866 (a continuation of the '393 Patent) to Jessup et al. The '393 Patent states in relevant part (Many of these statements are also included in the '866 Patent):

"Of secondary importance with respect to NO_x emissions are the 10% D-86 Distillation Point and the olefin content. In general, decreasing olefin content (e.g. below 15 volume percent, preferably to essentially zero volume percent) and/or decreasing the 10% D-86 Distillation Point (e.g., to values below 140°F. (60°C)) will

provide some reduction in NOx emissions. However, because it is contemplated that decreases in olefin content will be more acceptable to an oil refiner than decreasing the 10% D-86 Distillation Point sufficiently to significantly affect the NOx emissions, it is believed that, as a practical matter, it will be olefin content which will be the secondary variable providing the most flexibility to an oil refiner in altering the gasoline properties to reduce NOx emissions. (This is all the more the case inasmuch as, in general, if one wishes to decrease the Reid Vapor Pressure, it is usually necessary to increase the 10% Distillation Point.) Accordingly, best results are attained when both the olefin content is below 15 volume percent (preferably to zero) and the Reid vapor pressure is no greater than 7.5 psi - with it being highly desirable, if possible to also maintain the 10% D-86 Distillation Point below 140°F. (60° C.)." (column 2, lines 27-50).

"It has been discovered in the present invention, for many automobile engines, that the amount of pollutants emitted upon combustion is closely in accord with the following equation:

Equation 1.

Equation 2

$$\text{NOx (gm per mile)} = K_4 \times (\text{Vol. \% Olefins}) - K_5 \times (\text{Vol. \% Paraffins}) + K_6 \times (\text{D-86 Dist. 10\% Point in } ^\circ\text{F.}) + K_7 \times (\text{RVP in psi})$$

Equation 3

$$\text{HC (gm per mile)} = K_8 \times (\text{Vol. \% Olefins}) - K_9 \times (\text{Research Octane Number}) + K_{10} \times (\text{D-86 Dist. 50\% Point in } ^\circ\text{F.}) \quad (\text{column 5, lines 36-49})$$

"However, far more influential on the NOx emissions are the olefin content and the Reid vapor pressure, both of which cause substantial reductions in NOx emissions as they are substantially decreased." (column 6, lines 34-38)

", the most practical way to significantly lower the hydrocarbon emissions while retaining other beneficial properties of the fuel is y lowering the olefin content and/or by lowering the 50% D-86 Distillation Point." (column 6, lines 46-50)

Jessup et al. in the '393 patent evaluated the affects of various fuel compositions on reductions using six representative types of vehicles. They indicated

", the following facts stand out as most significant:

1. ...

2. Decreases in the Olefin Content caused reductions in NOx emissions from all the vehicles. (Column 13, lines 52-53)

"Presently, the most commercially attractive fuel producible in accordance with the invention has the following properties: (1) Olefin Content of 0%; (2) Reid Vapor Pressure of

7.5 psi (0.51 atm) maximum; and (3) 50% D-86 distillation point greater than 180 °F. (82°C) but no greater than 205 °F.(96 °C.)." (column 14 lines 3-8.)

Welstand et al. describe low emission, non-oxygenated gasoline fuel compositions in U.S. Patent 6,132,479.

"The gasoline fuel of the present invention also preferably has a low olefin content, e.g. no greater than 8 volume percent, more preferably 5 volume percent or less and most preferably 2-3 volume percent or less." (Column 8, lines 3-6)

Scott et al. described a series of blends of summer gasoline containing ethanol in a series of U.S. patents. In each of these patents:

"The olefin content is also less than 8 vol. %, more preferably less than 6 vol. %, and most preferably less than 3 vol. %." (US 6,328,772 - Column 8, lines 26-29; US 6,419,716 - Column 7, lines 48-49; US 6,540,797 - Column 7, lines 51-52)

The SIR by Townsend and the patents by Jessup, Scott et al. and Westland et al. describe the state of the relevant art at the time the current invention was made. The totality of the prior art must be considered, and proceeding contrary to accepted wisdom in the art is evidence of nonobviousness. *In re Hughes*, 783 F.2d 1038, 228 USPQ 685 (Fed. Cir. 1986) (Applicant's claimed process for sulfonating diphenyl sulfone at a temperature above 127°C was contrary to accepted wisdom because the prior art as a whole suggested using lower temperatures for optimum results as evidenced by charring, decomposition, or reduced yields at higher temperatures.)

Applicants therefore respectfully submit that the claim 16 cannot be obvious over Townsend. Further, because claims 17 - 19 depend from claim 16, Applicants respectfully submit that these claim cannot be obvious over Townsend.

The second criteria to establish obviousness is that there must be some reasonable expectation of success. The totality of the prior art must be considered, and proceeding

contrary to accepted wisdom in the art is evidence of nonobviousness. *In re Hughes*, (Applicant's claimed process for sulfonating diphenyl sulfone at a temperature above 127°C was contrary to accepted wisdom because the prior art as a whole suggested using lower temperatures for optimum results as evidenced by charring, decomposition, or reduced yields at higher temperatures.) As previously described, Townsend and the patents by Jessup, Scott et al. and Westland et al. explain the state of the relevant art at the time the current invention was made. The teachings from those inventions indicates that reduced olefin concentrations would be needed to reduce NOx and hydrocarbon emissions from automobile engines, and therefore there would not be some reasonable expectation of success.

Applicants therefore respectfully submit that the claim 16 cannot be obvious over Townsend. Further, because claims 17 - 19 depend from claim 16, Applicants respectfully submit that these claim cannot be obvious over Townsend.

The third criteria to establish obviousness is that the prior art reference (or references when combined) must teach or suggest all the claim limitations. As previously stated, Examiner has admitted that Townsend does not disclose all of the features recited in claim 16.

"While Townsend et al. differ from the instant claims in not disclosing an example of a fuel composition having all of the instantly claimed properties , ..."

Based on the previously presented material in this brief, Applicants respectfully submit that Townsend and the claims on appeal define two separate inventions, and it is not simply a matter that Townsend did not disclose an example of a fuel composition having all of the instantly claimed properties. There is no motivation in Townsend to modify its teachings to produce a fuel with an olefins content greater than 15 percent. No motivation to do so in the art generally has been presented by Examiner nor was motivation found in the

relevant art. Even if motivation could be found in the art, that teaching would conflict with the teaching of Townsend that lower olefins contents are not only preferable, but are to be "in the range of about 4 to about 10 volume percent".

Applicants therefore respectfully submit that the claim 16 cannot be obvious over Townsend since Townsend does not teach or discuss all of the claim limitations. Further, because claims 17 - 19 depend from claim 16, Applicants respectfully submit that these claim cannot be obvious over Townsend.

Applicants respectfully submit that the examiner has not met any of the three basic criteria that must be met to establish a *prima facie* case of obviousness.

There are several additional reasons why the present invention is not obvious in view of Townsend. If it were determined that a *prima facie* case of obviousness existed, this may be rebutted by showing that the art, in any material respect, teaches away from the claimed invention. *In re Geisler*, 116 F.3d 1465, 1471, 43 USPQ2d 1362, 1366 (Fed. Cir. 1997) (Applicant argued that the prior art taught away from use of a protective layer for a reflective article having a thickness within the claimed range of "50 to 100 Angstroms." Specifically, a patent to Zehender, which was relied upon to reject applicant's claim, included a statement that the thickness of the protective layer "should be not less than about [100 Angstroms]." The court held that the patent did not teach away from the claimed invention. "Zehender suggests that there are benefits to be derived from keeping the protective layer as thin as possible, consistent with achieving adequate protection. A thinner coating reduces light absorption and minimizes manufacturing time and expense. Thus, while Zehender expresses a preference for a thicker protective layer of 200-300 Angstroms, at the same time it provides the motivation for one of ordinary skill in the art to focus on thickness levels at the bottom of

Zehender's 'suitable' range- about 100 Angstroms- and to explore thickness levels below that range. The statement in Zehender that '[i]n general, the thickness of the protective layer should be not less than about [100 Angstroms]' falls far short of the kind of teaching that would discourage one of skill in the art from fabricating a protective layer of 100 Angstroms or less. [W]e are therefore 'not convinced that there was a sufficient teaching away in the art to overcome [the] strong case of obviousness' made out by Zehender.") The teachings of Townsend, et al. showed the need for reduced concentrations of olefins, not increased concentration, especially above the standard value of approximately 10 percent. Unlike *In re Geisler*, Townsend called for a reduction of olefin concentration below average industry value and explicitly called for olefin concentration of about 4 to about 10 volume percent. Townsend did not provide any motivation for one of ordinary skill in the art to focus on concentration of olefin that were significantly greater than the upper bound of about 10 percent levels at the upper end of Townsend's 'suitable' range.

An additional aspect that may be evaluated in determining obviousness involves the potential overlap of ranges of items in claims. A comparison of Townsend and the claims on appeal indicates that there is no-overlap of ranges in the concentrations of olefins. Townsend states "a concentration of olefins in the range of about 4 to about 10 volume percent" (column 6, lines 49-50) while the present application recites "an olefins content of greater than about 15%" (claim 16). A *prima facie* case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985) (Court held as proper a rejection of a claim directed to an alloy of "having 0.8% nickel, 0.3% molybdenum, up to 0.1% iron, balance titanium" as obvious over a reference disclosing alloys of 0.75% nickel, 0.25% molybdenum,

balance titanium and 0.94% nickel, 0.31% molybdenum, balance titanium.) In the present case the ranges are not close enough that one skilled in the art would have expected them to have the same properties. The teachings of Jessup et al. referred to previously explicitly indicate that different properties would be expected between gasolines with high and low olefin concentrations. Therefore a *prima facie* case of obviousness would not exist since claimed ranges and prior art ranges do not overlap and the properties of the items within each of the two groups are distinct and not close enough that one skilled in the art would have expected them to have the same properties.

Applicants respectfully submit that it is not clear, based on the Examiners comments in the Final Office Action, why one would have expected the teachings of Townsend to include the invention in the claims on appeal. "To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references." *Ex Parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985). The Examiner erred in reaching the conclusion by not "presenting a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references". The examiner has stated:

"While Townsend et al. differ from the instant claims in not disclosing an example of a fuel composition having all of the instantly claimed properties, it would have been obvious to one having ordinary skill in the art at the time the invention was made to follow the above teachings and arrive at the instantly claimed fuel compositions."

However the Examiner has not provided any reasoning as to how the presently claimed invention would have been obvious to one having ordinary skill in the art at the time the invention was made to follow the above teachings and arrive at the instantly claimed fuel

compositions, especially since the teachings of Townsend explicitly are directed towards composition that contained lower, rather than higher levels of olefins.

Applicants therefore respectfully submit that the present invention is not obvious over Townsend et al. under 35 U.S.C. § 103(a) because Townsend and prior art teach away from the current invention and there is no overlap of the claimed ranges of the concentrations of olefins between Townsend and the current invention.

Applicants respectfully submit that the examiner has not met any of the three basic criteria that must be met to establish a *prima facie* case of obviousness. Applicants further respectfully submit that even if a *prima facie* case of obviousness is established, it is rebutted by Townsend and the prior art teaching away from the current invention.

II. Rejection under 35 U.S.C. § 112, first paragraph is Improper

It is respectfully submitted that the Examiner has committed an error in the rejection of Claims 16-19 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. The Examiner has indicated:

"The claim(s) contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The specification fails to teach an oxygenated fuel having an octane rating of about 87 to about 94".

The specification provides numerous examples of oxygenated fuels with octane ratings of about 87 to about 94. Tables 1, 3 and 4 of the specification, which are shown in Appendix B, contain examples of oxygenated fuels,. The octane ratings of the blends of the various batches are given in the second column from the left in each of the tables, with octane ratings

of 87, 93 and 94 for the examples in Tables 1, 3 and 4, respectively. In each of these tables the per cent oxygen content is given in the right-most column, with oxygen content (%) of 1.858 - 2.897 in Table 1, 1.98 - 2.642 in Table 3, and 1.971 - 2.672 in Table 4. Examples of non-oxygenated fuels are found in Table 2, where the oxygen content (%) ranged from 0.016 to 0.049. A comparison of the oxygen content of the non-oxygenated fuels in Table 2 with the corresponding values for the examples in Tables 1, 3 and 4 demonstrate that the fuels in Tables 1, 3 and 4 are oxygenated.

Applicants therefore respectfully submit that claims 16-19 comply with the written description requirement under 35 U.S.C. § 112, first paragraph.

Conclusion

The claims on appeal are not obvious under 35 U.S.C. § 103(a) over the cited reference. While the cited reference describes a reformulated gas which requires the reduction in the concentration of olefinic compounds, the claims on appeal recite a fuel with olefins content of greater than about 15%, which is significantly higher, rather than lower, in olefin content than industry average base fuel gasoline, which has an olefin content of about 9.7% according to Townsend. The art also teaches that reduced concentrations of olefins are needed. A *prima facie* case of obviousness cannot be shown because: (1) there was no suggestion or motivation to used increased concentrations of olefins; (2) there was no reasonable expectation of success, based on prior art; and (3) the prior art did not teach or suggest all of the claim limitations. The claims comply with the written description requirement under 35 U.S.C. § 112, first paragraph, since the claims contain subject matter which were described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. It is respectfully requested that the Board use its authority to reverse the Examiner's rejection under 35 U.S.C. § 103(a) and 35 U.S.C. § 112,

first paragraph and allow the application.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Matthew P. McWilliams', written in a cursive style.

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October 20, 2004

Appendix A

Claims 16-19 are subject to appeal and are listed below.

16. An oxygenated transportation fuel complying with the emissions performance requirements of the Clean Air Act Amendments for Conventional Gasoline and for Reformulated Gasoline as predicted by the EPA Complex Model, said transportation fuel comprising a blend of hydrocarbon streams, said blend having the following properties:
- a) sulfur content of less than about 300ppm,
 - b) an octane rating of from about 87 to about 94,
 - c) a 50% D-86 distillation point of less than about 235°F,
 - d) a 90% D-86 distillation point of less than about 360°F,
 - e) an olefins content of greater than about 15%,
 - f) a Reid Vapor Pressure of less than 7.5; and
- at least one oxygenate.
17. The oxygenated transportation fuel according to claim 16, wherein said at least one oxygenate is selected from the group consisting of ethyl tert-butyl ether, methyl tert-butyl ether, tert-amyl methyl ether, methanol and ethanol.
18. The oxygenated transportation fuel according to claim 16, wherein said a 50% D-86 distillation point is greater than about 215°F.
19. The oxygenated transportation fuel according to claim 16, wherein said a 90% D-86 distillation point is greater than about 315°F.

Appendix B

US 2003/0019787 A1

Jan. 30, 2003

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TABLE 1

| 87 RFG Blends | | | | | | | | | | | | | | |
|---------------|---------------|---------|--------------------|-------------------|-------------------|--------------|--------------|------------|----------------|----------------|----------------|--------------------|-------------------|------------------|
| Batch ID | Octane Rating | RVP psi | Aromatic cont. (%) | Benzene cont. (%) | Olefins cont. (%) | D86 50% ° F. | D86 90% ° F. | Sulfur ppm | MtBE cont. (%) | EtBE cont. (%) | TAME cont. (%) | Methanol cont. (%) | Ethanol cont. (%) | oxygen cont. (%) |
| 0001 | 87 | 6.83 | 16.85 | 0.28 | 13.93 | 208 | 352 | 156 | 1.858 | 0 | 0 | 0 | 0 | 1.858 |
| 0002 | 87 | 6.35 | 15.94 | 0.62 | 17.17 | 193 | 343 | 203 | 2.541 | 0 | 0.016 | 0.025 | 0 | 2.582 |
| 0003 | 87 | 6.83 | 16.47 | 0.55 | 15.78 | 190 | 336 | 34 | 2.503 | 0 | 0 | 0 | 0 | 2.503 |
| 0004 | 87 | 6.60 | 24.81 | 0.57 | 11.57 | 219 | 316 | 102 | 1.949 | 0 | 0 | 0 | 0 | 1.949 |
| 0005 | 87 | 6.92 | 22.48 | 0.82 | 11.66 | 195 | 337 | 126 | 2.104 | 0 | 0 | 0 | 0 | 2.104 |
| 0006 | 87 | 7.31 | 23.51 | 0.54 | 11.76 | 188 | 331 | 135 | 2.092 | 0 | 0.005 | 0 | 0 | 2.097 |
| 0007 | 87 | 6.83 | 18.68 | 0.56 | 23.63 | 193 | 348 | 143 | 2.679 | 0 | 0.002 | 0 | 0 | 2.681 |
| 0008 | 87 | 6.69 | 18.02 | 0.53 | 12.37 | 182.8 | 336 | 146 | 2.6 | 0 | 0.002 | 0 | 0 | 2.602 |
| 0009 | 87 | 7.31 | 23.45 | 0.49 | 12.75 | 197 | 340.7 | 154 | 2.042 | 0 | 0.004 | 0 | 0 | 2.046 |
| 0010 | 87 | 7.03 | 22.36 | 0.47 | 10.76 | 195 | 347 | 166 | 1.945 | 0 | 0 | 0 | 0 | 1.945 |
| 0011 | 87 | 6.35 | 20.76 | 0.45 | 12.22 | 201 | 343 | 168 | 2.374 | 0 | 0 | 0 | 0 | 2.374 |
| 0012 | 87 | 7.06 | 23.17 | 0.45 | 13.44 | 209 | 347 | 171 | 1.782 | 0 | 0 | 0 | 0 | 1.782 |
| 0013 | 87 | 6.66 | 17.98 | 0.43 | 19.5 | 196 | 343 | 172 | 2.683 | 0 | 0.014 | 0.2 | 0 | 2.897 |
| 0014 | 87 | 6.56 | 34.25 | 0.58 | 18.06 | 198 | 341 | 189 | 2.626 | 0 | 0.002 | 0 | 0 | 2.628 |
| 0015 | 87 | 7.18 | 12.8 | 0.59 | 12.82 | 191.6 | 321.6 | 190 | 2.597 | 0 | 0 | 0 | 0 | 2.597 |
| 0016 | 87 | 6.73 | 23.81 | 0.5 | 15.93 | 219 | 347 | 239 | 2.584 | 0 | 0 | 0 | 0 | 2.584 |
| 0017 | 87 | 6.9 | 15.87 | 0.49 | 19.73 | 201 | 353 | 284 | 2.579 | 0 | 0 | 0 | 0 | 2.579 |
| 0018 | 87 | 6.57 | 17.09 | 0.57 | 19.44 | 197 | 348 | 298 | 2.312 | 0 | 0.008 | 0 | 0 | 2.32 |

[0020]

TABLE 2

| 93N Blends | | | | | | | | | | | | | | |
|------------|---------------|---------|--------------------|-------------------|-------------------|--------------|--------------|------------|----------------|----------------|----------------|--------------------|-------------------|------------------|
| Batch ID | Octane Rating | RVP psi | Aromatic cont. (%) | Benzene cont. (%) | Olefins cont. (%) | D86 50% ° F. | D86 90% ° F. | Sulfur ppm | MtBE cont. (%) | EtBE cont. (%) | TAME cont. (%) | Methanol cont. (%) | Ethanol cont. (%) | oxygen cont. (%) |
| 0019 | 93 | 6.63 | 31.86 | 0.59 | 7.71 | 230 | 319 | 41 | 0.03 | 0 | 0 | 0 | 0 | 0.03 |
| 0020 | 93 | 6.47 | 30.76 | 0.59 | 1.2 | 234 | 316 | 27 | 0.039 | 0 | 0 | 0 | 0 | 0.039 |
| 0021 | 93 | 6.15 | 27.33 | 0.45 | 1.3 | 231.7 | 312.1 | 34 | 0.049 | 0 | 0 | 0 | 0 | 0.049 |
| 0022 | 93 | 6.19 | 28.73 | 0.73 | 3.11 | 228 | 308 | 34 | 0.046 | 0 | 0 | 0 | 0 | 0.046 |
| 0023 | 93 | 6.4 | 36.18 | 0.82 | 4.8 | 227 | 312 | 36 | 0.016 | 0 | 0 | 0 | 0 | 0.016 |
| 0024 | 93 | 6.44 | 31.47 | 0.62 | 8.61 | 232.2 | 321.8 | 42 | 0.03 | 0 | 0 | 0 | 0 | 0.03 |
| 0025 | 93 | 6.54 | 24.1 | 0.55 | 5.71 | 224 | 310 | 57 | 0.028 | 0 | 0 | 0 | 0 | 0.028 |
| 0026 | 93 | 6.5 | 34.59 | 0.74 | 7.61 | 228 | 316 | 66 | 0.03 | 0 | 0 | 0 | 0 | 0.03 |
| 0027 | 93 | 6.5 | 35.73 | 0.77 | 3.3 | 231 | 317 | 25 | 0.16 | 0 | 0 | 0 | 0 | 0.16 |
| 0028 | 93 | 6.58 | 35.97 | 0.86 | 4.9 | 228.9 | 313.4 | 24 | 0.015 | 0 | 0 | 0 | 0 | 0.015 |
| 0029 | 93 | 6.7 | 35.19 | 0.61 | 3.81 | 229.5 | 321.6 | 27 | 0.03 | 0 | 0 | 0 | 0 | 0.03 |
| 0030 | 93 | 6.45 | 30.37 | 0.54 | 6.03 | 230 | 320 | 32 | 0.019 | 0 | 0 | 0 | 0 | 0.019 |
| 0031 | 93 | 6.44 | 28.05 | 0.6 | 5.41 | 229 | 310 | 42 | 0.043 | 0 | 0 | 0 | 0 | 0.043 |
| 0032 | 93 | 6.51 | 25.77 | 0.56 | 5.41 | 227 | 319 | 70 | 0.035 | 0 | 0 | 0 | 0 | 0.035 |

[0021]

TABLE 3

| 93RFG Blends | | | | | | | | | | | | | | |
|--------------|---------------|---------|--------------------|-------------------|-------------------|--------------|--------------|------------|----------------|----------------|----------------|--------------------|-------------------|------------------|
| Batch ID | Octane Rating | RVP psi | Aromatic cont. (%) | Benzene cont. (%) | Olefins cont. (%) | D86 50% ° F. | D86 90% ° F. | Sulfur ppm | MtBE cont. (%) | EtBE cont. (%) | TAME cont. (%) | Methanol cont. (%) | Ethanol cont. (%) | oxygen cont. (%) |
| 0033 | 93 | 6.72 | 25.31 | 0.34 | 9.77 | 216 | 330 | 3 | 2.507 | 0 | 0 | 0 | 0 | 2.507 |
| 0034 | 93 | 6.69 | 31.05 | 0.48 | 5.08 | 219.7 | 325.3 | 65 | 2.387 | 0 | 0 | 0 | 0 | 2.387 |
| 0035 | 93 | 6.82 | 30.39 | 0.55 | 7.17 | 219 | 328 | 84 | 2.166 | 0 | 0 | 0 | 0 | 2.166 |
| 0036 | 93 | 6.66 | 36.31 | 0.72 | 9.36 | 222.8 | 332.8 | 88 | 1.98 | 0 | 0 | 0 | 0 | 1.98 |
| 0037 | 93 | 6.4 | 35.52 | 0.56 | 9.46 | 220 | 327 | 90 | 2.163 | 0 | 0 | 0 | 0 | 2.163 |
| 0038 | 93 | 6.76 | 36.97 | 0.65 | 11.48 | 217.2 | 328.5 | 90 | 2.559 | 0 | 0 | 0 | 0 | 2.559 |
| 0039 | 93 | 6.43 | 21.73 | 0.29 | 10.78 | 212 | 328 | 97 | 2.628 | 0 | 0 | 0 | 0 | 2.628 |
| 0040 | 93 | 6.61 | 22.66 | 0.3 | 9.84 | 212 | 328 | 102 | 2.642 | 0 | 0 | 0 | 0 | 2.642 |
| 0041 | 93 | 6.53 | 26.53 | 0.37 | 13.33 | 213.5 | 328.7 | 106 | 2.575 | 0 | 0.002 | 0 | 0 | 2.577 |

TABLE 3-continued

| 93RFG Blends | | | | | | | | | | | | | | |
|--------------|---------------|---------|--------------------|-------------------|-------------------|--------------|--------------|------------|----------------|----------------|----------------|--------------------|-------------------|------------------|
| Batch ID | Octane Rating | RVP psi | Aromatic cont. (%) | Benzene cont. (%) | Olefins cont. (%) | D86 50% ° F. | D86 90% ° F. | Sulfur ppm | MtBE cont. (%) | EtBE cont. (%) | TAME cont. (%) | Methanol cont. (%) | Ethanol cont. (%) | oxygen cont. (%) |
| 0042 | 93 | 6.87 | 35.31 | 0.63 | 13.26 | 209.5 | 330.8 | 108 | 2.593 | 0 | 0 | 0 | 0 | 2.593 |
| 0043 | 93 | 6.89 | 25.59 | 0.39 | 11 | 212 | 327 | 110 | 2.604 | 0 | 0.002 | 0 | 0 | 2.606 |
| 0044 | 93 | 7.02 | 32.14 | 0.6 | 11.81 | 209 | 322 | 114 | 2.561 | 0 | 0 | 0 | 0 | 2.561 |
| 0045 | 93 | 6.76 | 26.2 | 0.42 | 13.17 | 222.8 | 332.8 | 272 | 2.535 | 0 | 0.004 | 0 | 0 | 2.539 |
| 0046 | 93 | 6.85 | 27.63 | 0.53 | 7.34 | 217 | 328 | 83 | 2.042 | 0 | 0 | 0 | 0 | 2.042 |
| 0047 | 93 | 6.93 | 30.52 | 0.44 | 10.87 | 211 | 329 | 102 | 2.237 | 0 | 0.002 | 0 | 0 | 2.239 |
| 0048 | 93 | 6.47 | 25.82 | 0.45 | 10.06 | 215.1 | 327.5 | 94 | 2.587 | 0 | 0.005 | 0 | 0 | 2.592 |
| 0049 | 93 | 6.76 | 22.17 | 0.31 | 11.36 | 214 | 331 | 84 | 2.618 | 0 | 0 | 0 | 0 | 2.618 |
| 0050 | 93 | 6.7 | 23.36 | 0.32 | 11.71 | 212 | 332 | 95 | 2.625 | 0 | 0.002 | 0 | 0 | 2.627 |

[0022]

TABLE 4

| 94 RFG Blends | | | | | | | | | | | | | | |
|---------------|---------------|---------|--------------------|-------------------|-------------------|--------------|--------------|------------|----------------|----------------|----------------|--------------------|-------------------|------------------|
| Batch ID | Octane Rating | RVP psi | Aromatic cont. (%) | Benzene cont. (%) | Olefins cont. (%) | D86 50% ° F. | D86 90% ° F. | Sulfur ppm | MtBE cont. (%) | EtBE cont. (%) | TAME cont. (%) | Methanol cont. (%) | Ethanol cont. (%) | oxygen cont. (%) |
| 0051 | 94 | 6.6 | 26.42 | 0.39 | 2.18 | 221 | 313 | 18 | 2.33 | 0 | 0.002 | 0 | 0 | 2.332 |
| 0052 | 94 | 6.67 | 25.46 | 0.39 | 15.49 | 214.5 | 325.3 | 30 | 2.643 | 0 | 0 | 0 | 0 | 2.643 |
| 0053 | 94 | 6.76 | 29.17 | 0.4 | 1.25 | 220 | 304 | 44 | 2.184 | 0 | 0 | 0 | 0 | 2.184 |
| 0054 | 94 | 6.48 | 25.37 | 0.38 | 1.8 | 218 | 304 | 52 | 1.971 | 0 | 0 | 0 | 0 | 1.971 |
| 0055 | 94 | 6.35 | 31.14 | 0.5 | 9.44 | 219.3 | 323.3 | 54 | 2.518 | 0 | 0 | 0 | 0 | 2.518 |
| 0056 | 94 | 6.57 | 37.21 | 0.49 | 7.87 | 221 | 314 | 56 | 2.657 | 0 | 0 | 0 | 0 | 2.657 |
| 0057 | 94 | 6.7 | 22.82 | 0.27 | 5.05 | 216 | 316 | 62 | 2.67 | 0 | 0.002 | 0 | 0 | 2.672 |
| 0058 | 94 | 6.41 | 34.5 | 0.63 | 7.52 | 220 | 320 | 65 | 2.388 | 0 | 0 | 0 | 0 | 2.388 |
| 0059 | 94 | 6.56 | 29.31 | 0.41 | 2.52 | 228 | 312 | 67 | 2.289 | 0 | 0 | 0 | 0 | 2.289 |
| 0060 | 94 | 6.7 | 22.15 | 0.34 | 5.18 | 217 | 318 | 69 | 2.726 | 0 | 0.002 | 0 | 0 | 2.728 |
| 0061 | 94 | 6.5 | 36.58 | 0.7 | 8.27 | 219.6 | 318.9 | 70 | 2.486 | 0 | 0 | 0 | 0 | 2.486 |
| 0062 | 94 | 6.61 | 45.97 | 0.33 | 12.26 | 219 | 314 | 71 | 2.554 | 0 | 0 | 0 | 0 | 2.554 |
| 0063 | 94 | 6.43 | 37.22 | 0.51 | 10.22 | 223 | 323 | 79 | 2.258 | 0 | 0 | 0 | 0 | 2.258 |
| 0064 | 94 | 6.86 | 26.9 | 0.41 | 12.96 | 211 | 323 | 82 | 2.575 | 0 | 0 | 0 | 0 | 2.575 |
| 0065 | 94 | 6.53 | 22.62 | 0.36 | 3.34 | 217 | 307 | 84 | 2.393 | 0 | 0 | 0 | 0 | 2.393 |
| 0066 | 94 | 6.74 | 29.41 | 0.44 | 9.6 | 219 | 331 | 96 | 2.589 | 0 | 0 | 0 | 0 | 2.589 |
| 0067 | 94 | 6.6 | 32.09 | 0.49 | 7.26 | 219.3 | 325.8 | 111 | 2.587 | 0 | 0.005 | 0 | 0 | 2.592 |